

# EVIDENCE-BASED TRADE POLICY FORMULATION: IMPACT ASSESSMENT OF TRADE LIBERALIZATION AND FTA

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# OUTLINE

- Introduction
- Ex-ante Methods
  - Trade and Trade Policy Indicators
  - Partial Equilibrium Models
  - CGE
- Ex-post Methods
  - Trade impact indicators
  - Gravity Models
  - Applying survey data
- Caveats
- Summary

# BENEFITS OF IMPACT ASSESSMENT (IA)

- Facilitates better trade negotiations
- Objective and transparent policy making
  - Less susceptible to lobbying
- Identify 'winners' and 'losers'
  - Targeted trade adjustment assistance programs
- Compare ex-ante predictions of trade policy impact with ex-post reality
  - Feeds into future trade policy making

# BASIC STEPS OF IA

- What kind of policy questions need to be answered ?
  - Impact of what ?
  - Impact on what ?
- Scan existing literature: find gaps
- Find the best suited methodology
- Assess if data and resources are available
- If not, choose a different methodology or collect new data
- Discuss clearly the limitations of methodology and underlying assumptions

# POLICY QUESTIONS

- Before negotiation of an FTA: An analysis of potential costs and benefits (ex-ante)
  - What a country can supply to its FTA partners? What it can source from the partners?
  - What are expected impacts on production and employment level and composition, welfare, fiscal balance, etc.
  - What are the costs for the adversely affected sectors?
- After its implementation: An impact assessment (ex-post)
  - Whether the impacts are within the expected range?
  - Whether the expected benefits are fully materialized?
  - Whether further adjustment in policies are necessary?

# EX-ANTE METHODS

# TRADE AND TRADE POLICY INDICATORS

# WHAT COULD BE RELEVANT TO ANALYZE ?

- How much of trade is intraregional?
  - Will the proposed FTA promote trade between trading partners?
  - Are they then “natural” trading partners?
- What is the comparative advantage of each member?
  - Which sectors are likely to have export (import) potential?
- Is export of a particular good regionally oriented?
  - How strong is a regional bias (if there is one)?
- How complementary is trade between a given pair of FTA members?
  - To what extent the export pattern of a country matches the import pattern of a region?
- What is a degree of similarity between partners' exports?
  - To what extent a country's export profile overlaps with other FTA members?



# ANALYZING TRADE FLOWS

- Descriptive statistics in trade are typically needed to picture the trade performance of a country:
  - How much does a country trade
    - Trade shares
  - What does it trade
    - Product shares
  - With whom
    - Partner shares

# TRADE INDICATORS

- Trade openness
  - trade-to-GDP, import penetration, export propensity....
- Trade performance
  - growth , trade balance, market shares, growth decomposition
- Geographical orientation of trade:
  - regional intensity, regional trade share
- Characteristics of trade
  - export diversification, intra-industry trade, import-content of exports, revealed technology content
- Trade opportunity/competitiveness
  - RCA, complementarity

# TRADE-POLICY INDICATORS

- Tariff profiles: average tariffs, dispersion, effective protection
- Non-tariffs: frequency ratio, prevalence ratio
- Example : IPS study on China- Sri Lanka FTA
  - list of goods with comparative advantage of Sri Lanka vis-à-vis the world (566)
  - Does china import all these products ? (No, exclude 24)
  - How many products does it export to China already (243) ?
  - New market opportunities for Sri Lankan producers, manufacturers and exporters in 299 products.

# MERITS AND LIMITATIONS

- Provides an overview
- Can lead to interesting policy questions.
- They cannot provide precise numbers that quantify the effect of an FTA on trade, production, consumption, or welfare
- Cannot determine the causes
- They can be misleading if data is unsuitably classified
  - Trade classifications do not match a country's production structure
  - Data often very aggregated

# PARTIAL EQUILIBRIUM ANALYSIS

# POLICY QUESTIONS THAT CAN BE ANSWERED BY PE MODELS

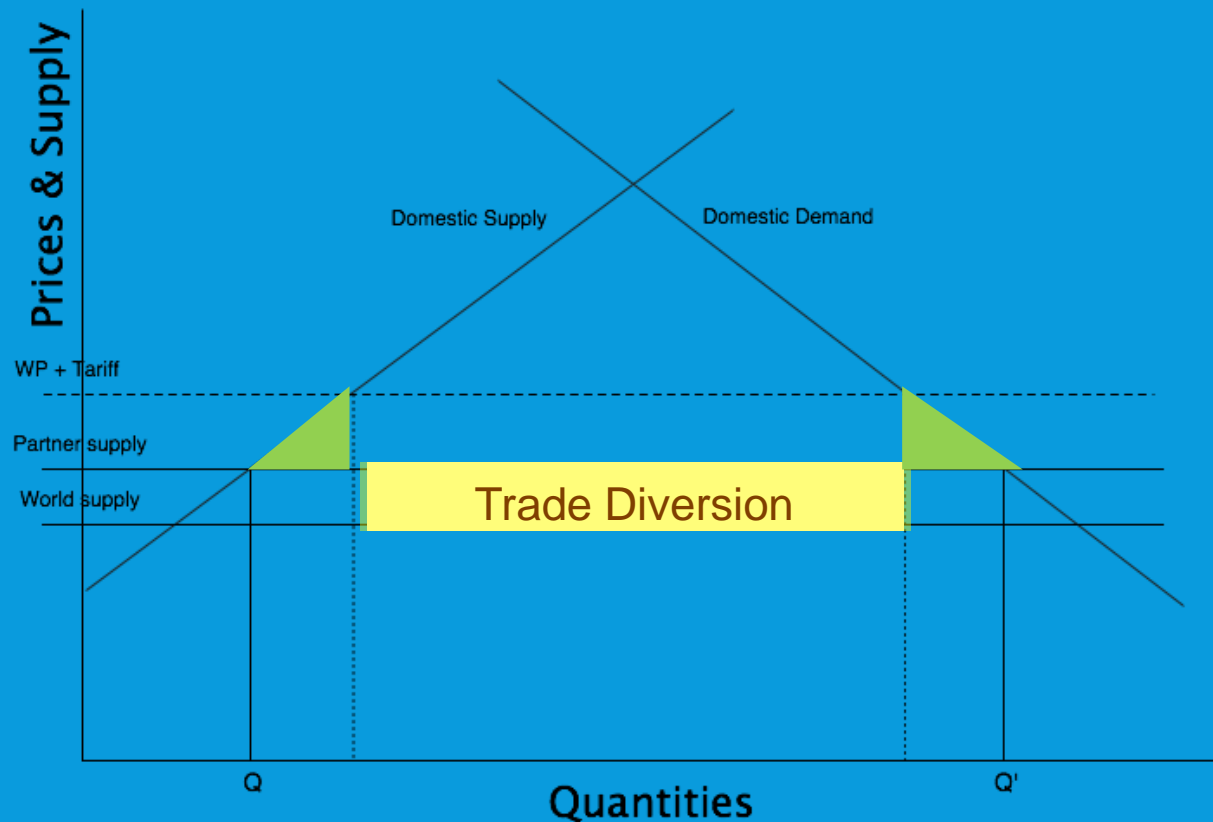
- How an FTA will affect trade flows for a single commodity?
  - What will be an import increase?
  - What will be an export increase of FTA partners?
  - What will be an export decrease of non-member countries?
  - What will be a fall in tariff revenue?

Direct effect of a trade policy change in a single market, ignores spill over effect, feedback effect

# REASONS FOR FOCUSING ON AN INDIVIDUAL PRODUCT:

- Its trade is significant in the country's trade balance
  - It generates substantial tariff revenue,
  - It employs a large share of the country's workforce
  - Its output contributes significantly to GDP
  - Firms in the sector may be important political players
  - It may be located in an important region of a country
- 
- The in-depth analysis at the level of individual industry or product makes partial equilibrium (PE) approach more appropriate

# BASICS OF PARTIAL EQUILIBRIUM (PE) ANALYSIS



**Summary:** *the net trade effect depends on whether the loss of efficiency due to diversion (yellow rectangle) is greater or less than the gains in efficiency (green triangles).*



# HOW TO IMPLEMENT PE ANALYSIS?

- SMART
  - ignores world market impacts
- GSIM :
  - incorporates changes in world prices and the welfare impact
- TRIST :
  - takes a more careful look at actual revenues collected from trade, including all taxes levied on trade and not just tariffs

# EXAMPLE 1: CHINA - SRI LANKA FTA

- Joint feasibility study (JFS) using PE models
- The JFS analysed how the FTA will affect the Rubber Products - an important sector for Sri Lanka
- Findings :
  - Sri Lanka's exports to China will greatly increase with liberalization of trade in rubber products.
  - China's imports of rubber products from Sri Lanka to increase by USD 22.09 million after the complete liberalization of trade : increase in export of 120 %.
  - Import by Sri Lanka to increase : exports from China increasing by 17%

## EXAMPLE 2: SUSHIL KUMAR & SHAHID AHMED, 'IMPACT OF SENSITIVE LISTS UNDER SAFTA: QUANTITATIVE ASSESSMENT USING A PARTIAL EQUILIBRIUM MODELING', EUROPEAN JOURNAL OF GLOBALIZATION AND DEVELOPMENT RESEARCH, VOL. 10, NO. 1, 2014

- Study analyzes the impact of sensitive list (Phase II) under the SAFTA at disaggregate level (HS6 digit) by using partial equilibrium modeling.
- Looked at consumer surplus, trade creation, trade diversion as well as impact on tariff revenues among India, Pakistan, Sri Lanka and Bangladesh as a result of removal of sensitive list.
- The impact of tariff reduction (sensitive product under SAFTA) in India on imports from Sri Lanka would generate an increase in imports equivalent to US\$ 33.97 million, implying the trade creation of US\$20.65 million and US\$13.31 million in trade diversion.

# ADVANTAGES AND LIMITATIONS

- PE models can be used to compute trade impacts of trade policy at a very disaggregated level of statistical product classification
  - Often at the level at which trade liberalization and rule of origin in trade agreements are negotiated
- Easier to implement than general equilibrium
- Less of a black box than general equilibrium
- Less intensive on data requirements
- Easy to change parameters and check for robustness to different assumptions

# ADVANTAGES AND LIMITATIONS

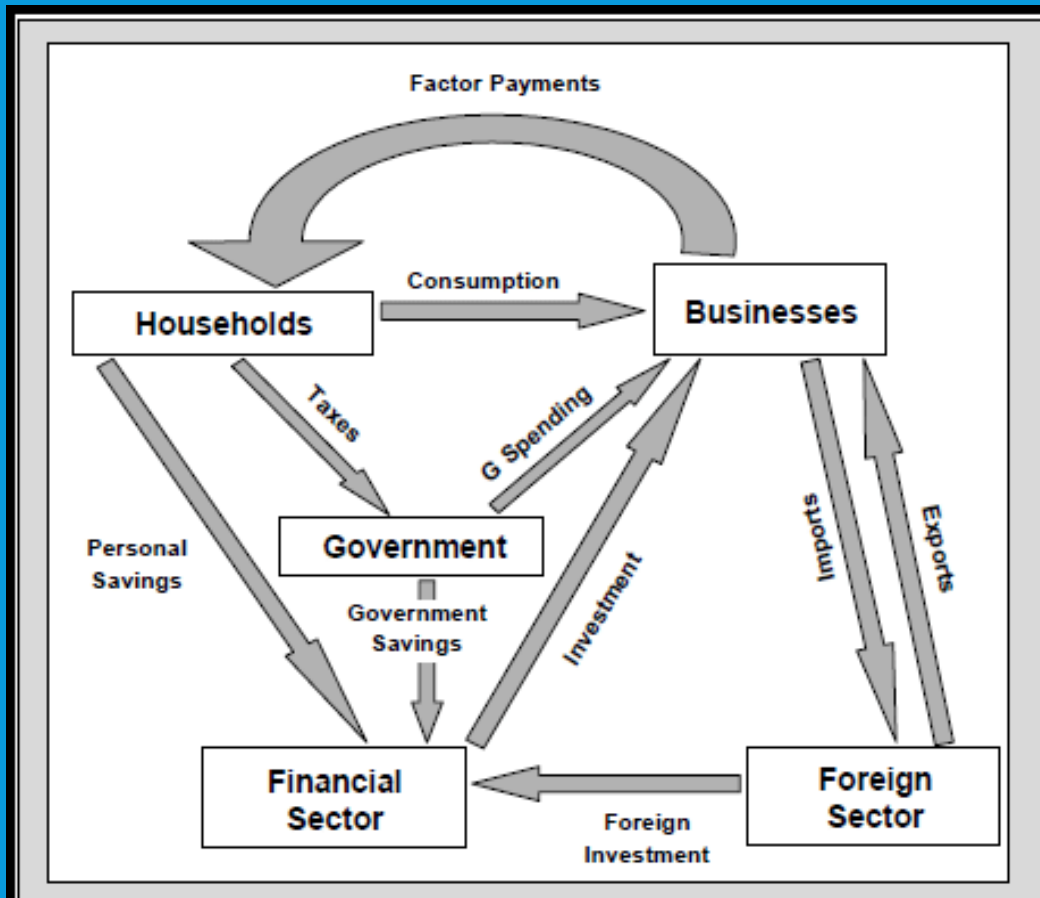
- Sources of bias in PE:
  - It ignores the inter-industry effects and the feedback effects of a trade policy change
  - NTMs
  - The existing constraints that apply to the various factors of production (e.g., labor, capital, land...) and their movement across sectors.
  - Very sensitive to the values used for the elasticities
  - Magnitude of this bias may reach several hundred percent or more (Samuel and Yeats (1990))

# Computable General Equilibrium Models

# POTENTIAL ECONOMY-WIDE IMPACTS

- What are the macro-level impacts of an FTA (when interactions between all markets are accounted for)?
  - real GDP
  - trade balance
  - terms of trade
  - import and export prices in a particular sector
  - output and trade in different sectors within the country
  - national welfare (and where will these welfare effects come from?)
- The multi-sectoral trade liberalization makes CGE approach more appropriate
  - It combines direct effects of tariff reductions in individual markets with indirect changes in related markets

# CGE FUNDAMENTALS



- Different markets in a given economy are linked, and changes that take place in one market affects other markets;
- CGE models use Social Accounting Matrix (SAM) to capture these various linkages
- They take into account cross-sectoral reallocation of factors of production

Source : Barry (2009)



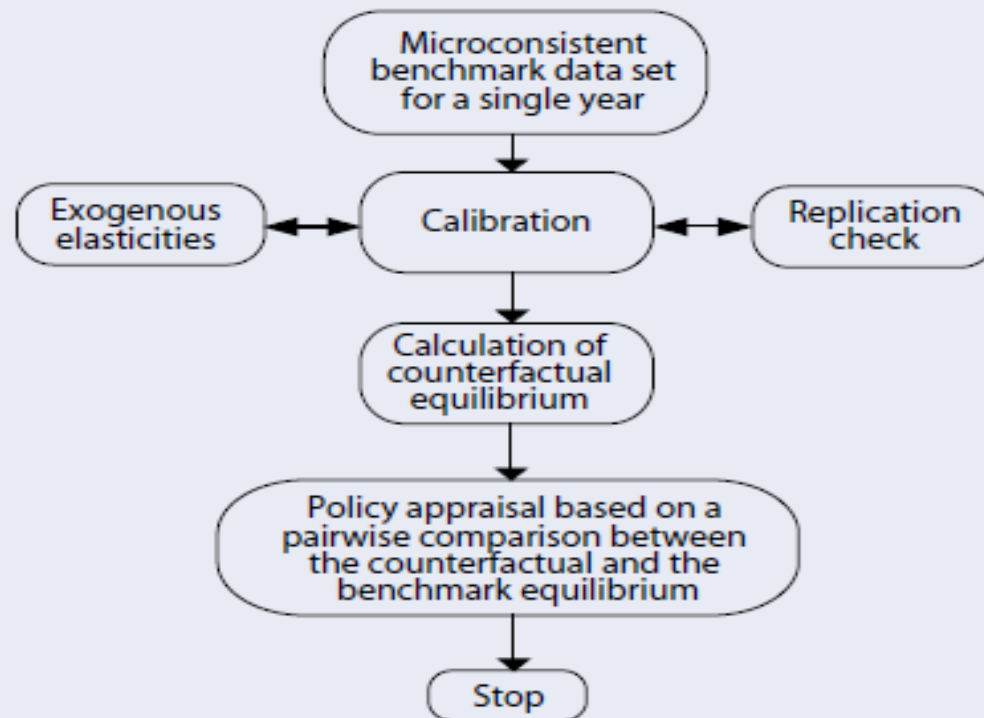
# CGE FUNDAMENTALS

- Grounded on micro theory
- Clearly quantifiable results
- Uses the power of computing to capture complexities
- fresh insights about the role of certain economic assumptions in determining the results

# CGE ANALYSIS : KEY COMPONENTS

- Clarify Assumptions
  - define the behavior of households, firms and governments
  - Clearly state the exogenous and endogenous variables (prices, income)
- Social Accounting Matrix
  - how things are interlinked ?
- Elasticities
  - how components move in response to changes in other components
- Calibration
  - Show the model can replicate reality of a baseline year
- Run simulations and describe scenarios
  - Need of 'thick descriptions'
- Sensitivity tests
  - Prove results are stable

# THE CGE PROCESS



Source: Shoven, J. B ., and Whalley, J. 1992. *Applying General Equilibrium*. Cambridge, United Kingdom: Cambridge University Press.

**EXAMPLE 1 : ANTOINE BOUËT, SIMON MEVEL AND MARCELLE THOMAS  
(2010) 'IS SAFTA TRADE CREATING OR TRADE DIVERTING?', JANUARY  
2010, IFPRI DISCUSSION PAPER 00950**

- Simulate the effects of SAFTA with and without sensitive products
- Finds that among South Asian countries, Sri Lanka gains the most from the agreement because it initially has relatively low tariffs and faces high tariffs in the region
- Exempting sensitive products from the agreement limits gains from trade for the lower-middle-income members of SAFTA but may be welfare enhancing for the least developed economies
- In Sri Lanka, positive effects on the remuneration of the factors of production, especially for land and natural resources, suggesting that agriculture stands to gain from liberalization
- At the sectoral level, the production of oilseeds and other crops in Sri Lanka, bovine meat and meat products in Bangladesh and the Rest of South Asia, and wearing apparel in Bangladesh gain the most under SAFTA scenario

**EXAMPLE 2: SUMUDU PERERA, MAHINDA SIRIWARDANA & STUART MOUNTER (2014) REDUCING POVERTY AND INCOME INEQUALITY IN SRI LANKA: DOES TRADE LIBERALISATION HELP?, JOURNAL OF THE ASIA PACIFIC ECONOMY, 19:4, 629-655**

- Two trade liberalization policy simulations are investigated: (1) the formation of a South Asian Free Trade Agreement and (2) unilateral trade liberalization in South Asia
- The results indicate that overall income inequality and income inequality among different household groups in the urban, rural and estate sectors in Sri Lanka would fall under both trade liberalization policies
- Poverty would also decline in all three sectors
- In both instances, unilateral trade liberalization delivers the greatest reductions

# WHEN NOT TO USE CGE?

- Small sector/region/issue with rich data on particular aspects: impossible to incorporate into a CGE model, e.g., time-series/survey data.
- Complex model capturing structural details of a region/sector that cannot be *fed* into a CGE framework.
- Where one requires statistical significance of the results (although there is a way of doing a similar thing in CGE)
- Services and Investment considerations
  - Potential Sri Lanka Singapore FTA ?

# LIMITATIONS OF CGE

- Heavy data requirements
- Sensitivity to assumptions and data
- Lack of time dimension (in most models)
- NTMs , productivity spill overs not (yet) fully incorporated

# EX-POST IMPACT ASSESSMENT

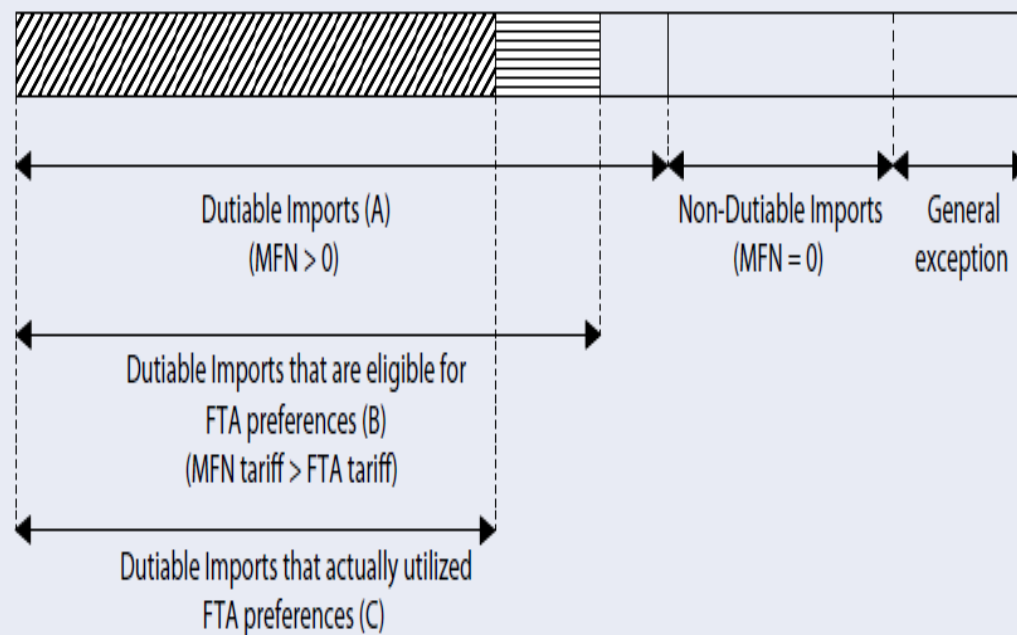


- Were the preferences utilized?
- Did the FTA raise welfare of the country in question?
- What were the channels of transmission of FTA-triggered trade flows changes to households' welfare?

# WERE THE PREFERENCES UTILIZED?

- Preference margin – also known as MOP- (the attractiveness of a preferential regime relative to MFN treatment)
  - MFN-FTA tariff
  - The compliance cost has to be lower than the preference margin for exporters to utilize the preferences.
- They do not identify the reasons behind the results -thus, firm survey may be used to fill the gap

Figure 3.1 Structure of Imports and Formulas for Free Trade Agreement Preference Indicators



$$\text{Coverage Rate} = B/A * 100$$

$$\text{Utility Rate} = C/A * 100$$

$$\text{Utilization Rate} = C/B * 100$$

FTA = free trade agreement, MFN = most favored nation.

# GRAVITY MODEL OF TRADE

- The gravity model is an econometric method of estimating trade flows
  - Tinbergen (1962) compared the size of bilateral trade flows between any two countries to the gravitational force in physics between two objects.
  - Since then, many theoretical models that yield the gravity equation for trade has been produced.
- It was used to analyze the impact of FTAs, GATT- WTO membership, TBTs, NTBs, currency unions, etc. on trade flows.
- The main advantage is that it can control for the effects of other trade determinants besides the FTA, and can therefore isolate the effects of the FTA on trade.

# GRAVITY MODEL

- Relates the imports of country  $i$  from country  $j$  ( $M_{ij}$ ) positively to the sizes of the two countries ( $Y_i$  and  $Y_j$ ), but negatively to the geographical distance between them ( $D_{ij}$ ).

$$M_{ij} = G \frac{Y_i Y_j}{D_{ij}}$$

$$\ln M_{ij} = G + \beta_1 \ln Y_i + \beta_2 \ln Y_j + \beta_3 \ln D_{ij} + u_{ij}$$

- Based on theoretical foundations further variables can be added

$$\ln M_{ij}^t = G + \beta_1 \ln Y_i^t + \beta_2 \ln Y_j^t + \beta_3 \ln D_{ij} + TradeCreate + TradeDivert + MTR_i + MTR_j + YEARS + u_{ij}^t$$

# EXAMPLE

- **Anoma Abhyaratne and Sumati Varma, 'IMPACT OF FTAs ON TRADE FLOWS: A STUDY OF THE INDIA SRI LANKA FREE TRADE AGREEMENT (ISLFTA)' FREIT working paper 983**
- Using panel data for the period 1990-2014, provide evidence that the FTA has promoted trade between the countries.
- Contends that FTA has created large trade creation effects. There is no diversion effect of exports of other South Asian countries to India and Sri Lanka.
- Larger trade creation effects that exceed the diversion effects indicate the welfare gains from the free trade agreement between India and Sri Lanka.

# ADVANTAGES

- Data for the gravity model is widely available
- The model has a high level of explanatory power
- Although a theoretical gravity model could be complicated, there are established standard practices that facilitate the work of researchers
- It allows controlling for other trade-related variables and quantify any changes in a country's trade due to the FTA
- These quantitative estimates may then be used in welfare calculations

# OTHER EX-POST APPROACHES

- Use of sample survey data :
  - estimate exposure of households or enterprises to trade policy, industry where they are employed,
  - estimate impact of trade policy on poverty, inequality, productivity, gender impact etc.
  - Uncover mechanisms of impact
  - See Topalova (2005), Sundaram (2015)

$$y_{dt} = \alpha + \beta \cdot \text{Tariff}_{dt} + \gamma_t + \delta_d + \varepsilon_{dt}$$

# CAVEATS

Quantitative results should not be over-sold

- the econometric technique has its own limitations
- Vulnerable to inaccurate data
- important variables are omitted
- Endogeneity of trade policy parameters, leading to biased results



# CONCLUDING REMARKS

- Explore complementarities of methods
- Test applicability of underlying assumptions especially in developing country settings
- Supplement with stakeholder consultations
- How to integrate Impact Assessment with 'sustainability' impact assessments ?
- Unquantifiable but strategic impacts
  - Technology transfer and diffusion
  - Macro economic and political stability
  - Structural reform and capacity building

# SUMMARY

Policy purpose	Methods
Overview of trade and trade policy	Use trade indicators and trade policy measures
Ex-ante impact on specific sector of interest	Partial equilibrium models (SMART, GSIM, TRIST)
Ex-ante economy-wide impacts	CGE
Ex-post overview	Usage of preference measures, simple trade indicators
Ex-post actual impact	Gravity models
Detailed analysis of impact on household, firm level development outcomes	Use survey data and econometric analyses

# Thank You

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